Space Weather Forecast

Issued on Friday 25 October 2024 at 12:06 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares likely, slight chance of further Strong flares. Chance G1-G2/Minor-Moderate geomagnetic storm intervals days 2 and 3 (26/27 Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate in the past 24 hours with an isolated Moderate class flare at 25/0733 UTC originating from an active region near the east limb. There are currently ten numbered spot regions on the disc. The main focus is toward the southeast of the disc, with three significant bipolar regions located here, including one which gave a strong class flare on 24 Oct. Most other regions on the disc are smaller or simple and exhibit only small changes in evolution.

The strong flare produced by one of the southeastern spot regions on 24 Oct gave a coronal mass ejection that has been assessed as a likely miss, passing behind Earth, though some Earth-directed component is possible from shock possibly arriving 26 or 27 Oct. No other Earth directed CMEs (coronal mass ejections) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were generally indicative of background conditions. Speeds were slow-ambient and on a slight falling trend. The Interplanetary Magnetic Field remained weak, with the north-south component also weak. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) persisted at background with no Solar Radiation Storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate is expected, with Moderate-class flares considered likely and a slight chance of further Strong-class flares.

Solar Wind / Geomagnetic Activity: The are currently no Earth-directed coronal mass ejections, but two or three coronal mass ejections which may give shock or glancing impacts day 2 or day 3 (26/27 Oct). Solar winds are currently at background levels. Winds are expected to remain at largely background levels until day 2 (26 Oct) with fast winds from a trans-equatorial coronal hole peaking at slightly elevated or elevated speeds before waning during day 3 (27 Oct).

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Activity is expected to be largely Quiet to Unsettled (Kp 1-3) to start. The combined onset of any coronal hole enhancement, and the influence of any shock or glancing coronal mass ejection impacts brings a chance of G1-G2/Minor-Moderate geomagnetic storms (Kp5-6) during day 2 (26 Oct) or early day 3 (27 Oct) before easing into day 4 (28 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no Solar Radiation Storms currently expected.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	40	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	60	60	60	60
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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